Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A ~~miniaturized thin-film fuel cell~~ device for converting chemical energy of a fuel containing hydrogen into an electrical current without combustion, comprising:

a plurality of miniaturized thin-film fuel cells spaced from one another by a frame, each of the thin-film fuel cells including

a first manifold structure constructed from a first substrate having a first face surface and a first back surface and ~~an~~ a first elongate fuel chamber defined therein for receiving the fuel, said first elongate fuel chamber having an elongate opening along said first face surface and extending through the first substrate to define a first back opening along said first back surface;

a second manifold structure constructed from a second substrate having a second face surface and second back surface and a second elongate fuel chamber defined therein for receiving the fuel, said second elongate fuel chamber having an elongate opening along said second face surface and extending through the second substrate to define a second back opening along said second back surface;

said first and second substrates being bonded together along said first and second back surfaces such that said first and second elongate fuel chambers are in fluid communication with each other;

~~an~~ a first elongate electrolyte secured between ~~an~~ a first anode positioned adjacent to said first elongate fuel chamber and a first cathode positioned adjacent to an oxygen containing region, said first elongate electrolyte operably secured to the first face surface of said first substrate adjacent to said first elongate fuel chamber thereby hydraulically isolating said first elongate fuel chamber from the oxygen containing region; and

a second elongate electrolyte secured between a second anode positioned adjacent to said second elongate fuel chamber and a second cathode positioned adjacent to the oxygen containing region, said second electrolyte operably secured to the second face surface of said second substrate adjacent to said second elongate fuel chamber thereby hydraulically isolating said second elongate fuel chamber from the oxygen containing region;

wherein fuel received within said first elongate fuel chamber is operably engaged with the first anode along the length of the elongate opening, and oxygen from the oxygen containing region is operably engaged with the first cathode such that when encouraged by a catalyst, hydrogen atoms from the fuel split into a proton and an electron, which take different paths to the first cathode thereby producing the electric current;

wherein fuel received within said second elongate fuel chamber is operably engaged with the second anode along the length of the second elongate opening, and oxygen from the oxygen containing region is operably engaged with the second cathode such that when encouraged by a catalyst, hydrogen atoms from the fuel split into a proton and an electron, which take different paths to the second cathode thereby producing electric current; and

wherein the first and second elongate fuel chambers of the plurality of said miniaturized thin-film fuel cells are in fluid communication with each other.

2. (Currently Amended) The ~~miniaturized thin-film fuel cell~~ device of claim 1, wherein said first substrate is a silicon wafer.

3. (Currently Amended) The ~~miniaturized thin-film fuel cell~~ device of claim 1, wherein said first substrate is a portion of a silicon wafer.

4. (Currently Amended) The ~~miniaturized thin-film fuel cell~~ device of claim 1 ~~, further including:~~

wherein the first elongate fuel chamber comprises a plurality of first elongate fuel chambers received within the first substrate, each of said first ~~fuel chamber of the plurality of~~ elongate fuel chambers having ~~a~~ an elongate opening along said first face surface and being in fluid communication with the other ~~each of said plurality of~~ first elongate fuel chambers; and

wherein the first elongate electrolyte comprises a plurality of elongate electrolytes secured between first anodes ~~, one~~ respectively positioned adjacent to ~~each of~~ said first elongate fuel chambers and first cathodes positioned adjacent to the oxygen containing region, said first electrolytes operably secured to the first face surface of said first substrate ~~, one each positioned~~ and respectively adjacent to ~~each~~ said first elongate fuel chambers ~~of the plurality of fuel chambers~~, thereby hydraulically isolating said plurality of first elongate fuel chambers from the oxygen containing region.

5. (Currently Amended) The ~~miniaturized thin-film fuel cell~~ device of claim 1, wherein said ~~fuel cell is a~~ fuel cells are proton exchange membrane fuel ~~cell~~ cells and the ~~electrolyte is a~~ electrolytes comprise proton conducting electrolyte material.

6. (Currently Amended) The ~~miniaturized thin-film fuel cell~~ device of claim 5, wherein said proton conducting electrolyte material is a perfluorinated sulfonic acid polymer having a thickness between 50-100 μm, inclusive.

7-11. (Canceled)

12. (Currently Amended) The ~~miniaturized thin-film fuel cell~~ device of ~~claim 11~~ claim 1, wherein said the fluid communication between the elongate fuel chambers of the plurality of said miniaturized thin-film fuel cells is in a serpentine or parallel pattern.

13. (Currently Amended) The ~~miniaturized thin-film fuel cell of claim 9, further including:~~ device of claim 1

wherein the first elongate fuel chamber comprises a plurality of first elongate fuel chambers received within the first substrate ~~, each said fuel chamber of the plurality of elongate fuel chambers having a elongate opening along said face surface~~ and in fluid communication with ~~the other of each of said fuel chambers of said plurality of fuel chambers~~ one another;

wherein the first elongate electrolyte comprises a plurality of first elongate electrolytes secured between first anodes ~~, one~~ respectively positioned adjacent to ~~each of said elongate fuel chambers of~~ said plurality of first elongate fuel chambers and first cathodes positioned adjacent to the oxygen containing region, said first electrolytes operably secured to the first face surface of said substrate ~~, one each~~ and respectively positioned adjacent to ~~each~~ said ~~fuel chamber of the plurality of~~ first elongate fuel chambers, thereby hydraulically isolating said first elongate fuel chambers from the oxygen containing region;

wherein the second elongate fuel chamber comprises a plurality of second elongate ~~second~~ fuel chambers received within the second substrate ~~, each said second fuel chamber of the plurality of elongate second fuel chambers having a second elongate opening along said second face surface~~ and in fluid communication with ~~the other fuel chambers of said plurality of fuel chambers~~ one another; and

wherein the second elongate electrolyte comprises a plurality of ~~elongate~~ second elongate electrolytes secured between second anodes ~~, one~~ respectively positioned adjacent to ~~each of~~ said plurality of second elongate fuel chambers and second cathodes positioned adjacent to the oxygen containing region, said second electrolytes operably secured to the second face surface of said second substrate ~~, one each~~ and respectively positioned adjacent to ~~each~~ said second elongate fuel chambers ~~of the second plurality of fuel chambers~~, thereby hydraulically isolating said plurality of elongate second elongate fuel chambers from the oxygen containing region;

wherein the first elongate fuel chambers ~~of the substrate~~ and the second elongate fuel chambers ~~of the second substrate~~ are in fluid communication with each other.

14. (Original) A method for making a thin-film fuel cell including a manifold structure made from a substantially planar thin-film substrate having a face surface, comprising the steps of:

defining an elongate fuel chamber in the thin-film substrate such that the chamber provides an elongate opening along the face surface of the substrate;

operably securing an elongate proton exchange membrane-electrode assembly, having an anode and cathode, to said substrate and adjacent to said elongate fuel chamber;

filling said fuel chamber with fuel containing hydrogen such that the fuel operably engages with the anode along the length of the elongate opening, and oxygen from an oxygen containing region is operably engaged with the cathode such that when encouraged by a catalyst, hydrogen atoms from the fuel split into a proton and an electron, which take different paths to the cathode thereby producing electric current.

15. (Original) The method of making a thin-film fuel cell of claim 14, further including the step of stacking a plurality of said thin-film fuel cells in a frame such that the thin-film fuel cells within the frame are spaced apart from each other, but in electrical communication with each other.

16. (Original) The method for making a thin-film fuel cell of claim 14, further including the steps of:

defining an elongate second fuel chamber in a second thin-film substrate such that the second chamber provides a second elongate opening along the second face surface of the second substrate;

operably securing a second elongate proton exchange membrane-electrode assembly, having a second anode and a second cathode, to said substrate and adjacent to said second elongate fuel chamber;

bonding said thin-film substrate and said second thin-film substrate together such that said elongate fuel chamber and said second fuel chamber are in fluid communication with each other; and

filling said second fuel chamber with fuel containing hydrogen such that the fuel operably engages with the second anode along the length of the

elongate opening, and oxygen from an oxygen containing region is operably engaged with the second cathode such that when encouraged by a catalyst, hydrogen atoms from the fuel split into a proton and an electron, which take different paths to the cathode thereby producing electric current.

17. (Original) The method of making a thin-film fuel cell of claim 16, further including the step of stacking a plurality of said thin-film fuel cells in a frame such that the thin-film fuel cells within the frame are spaced apart from each other, but in electrical communication with each other.

18. (Previously Presented) A thin-film fuel cell, comprising:

a substrate defining a plurality of elongate fuel chambers with respective elongate fuel chamber openings; and

a plurality of elongate fuel cells, including respective anodes and cathodes, secured to the substrate and positioned over respective elongate fuel chamber openings such that the anodes face the elongate fuel chambers and the cathodes are hydraulically isolated from the elongate fuel chambers.

19. (Previously Presented) A thin-film fuel cell as claimed in claim 18, wherein the substrate comprises a silicon wafer.

20. (Previously Presented) A thin-film fuel cell as claimed in claim 18, wherein the substrate comprises a portion of a silicon wafer.

21. (Previously Presented) A thin-film fuel cell as claimed in claim 18, wherein the elongate fuel cells comprise elongate proton exchange membrane fuel cells including a proton conducting electrolyte material between the anodes and cathodes.

22. (Previously Presented) A thin-film fuel cell as claimed in claim 21, wherein the proton conducting electrolyte material comprises a perfluorinated sulfonic acid polymer having a thickness between 50-100 μm.

23. (Currently Amended) A thin-film fuel cell ~~as claimed in claim 18, wherein the plurality of elongate fuel chambers are~~ , comprising:

a substrate defining a plurality of elongate fuel chambers connected to one another and having respective elongate fuel chamber openings; and

a plurality of elongate fuel cells, including respective anodes and cathodes, secured to the substrate and positioned over respective elongate fuel chamber openings such that the anodes face the elongate fuel chambers and the cathodes are hydraulically isolated from the elongate fuel chambers.

24. (Currently Amended) A thin-film fuel cell as claimed in ~~claim 18~~ claim 23, wherein the plurality of elongate fuel chambers are connected to one another in series.

25. (Previously Presented) A thin-film fuel cell as claimed in claim 24, wherein the plurality of elongate fuel chambers define respective longitudinal ends and are connected to one another at the longitudinal ends.